

Title: Chemiluminescence-based Microfluidic Biochip

ABSTRACT

The disclosure describes how to use luminescence detection mechanism, move microfluid, and control multiple-step biochemical reactions in closed confined microfluidic biochip platform. More particularly, a self-contained disposable biochip with patterned microchannels and compartments having storage means for storing a plurality of samples, reagents, and luminescent substrates. At least one external microactuator in the biochip system produces positive pressure and automates multiple-step reactions in microfluidic platforms for clinical chemistry, cell biology, immunoassay and nucleic acid analysis. The method comprises the steps of transferring sequentially at least one of samples, reagents, and then luminescent substrate from compartments through microchannels to reaction sites. The luminescent substrates react with probes to form a probe complex resulting into luminescence, which is detected by an optical detector.